

Chironomidae from a small stream system in Western Ireland with a discussion of species composition of the group (Dipt.)

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An account of the Chironomidae in Ireland has recently been given by Murray (1972). Some 216 chironomid species are known to occur in Ireland and this figure represents approximately 16 % of the chironomid fauna recorded from Europe (Fittkau, Schlee and Reiss, 1967). In this paper a list of 54 species which occur in a small stream system in western Ireland is presented. Included in this total are 19 species which are new Irish records.

The streams, part of the Altahoney River, from which the material described here was obtained, are situated 9.6 km north of Newport, Co. Mayo (Irish Grid Ref. F9505). The system is small, having a catchment area of 109 km² (Fig. 1). Much of the basin has been drained for forestry purposes and consequently flash flooding is frequent. Some characteristics of the sites examined, which lie between 40 and 160 metres above sea level, are given in Table 1. The substratum, of quartzite boulder clay, varies from a condition of stability (i.e. including interstitial sand) to an unstable condition in which only large stones occur. Bedrock is exposed at some places. The allochthonous material at most places is grass detritus, mostly *Molinia caerulea* (L) but deciduous leaves are also present. During the summer months algal growth on stones was profuse following dry periods when the water current was insufficiently strong to remove the filaments. Water temperatures at most parts of the system showed close agreement with the mean air temperature during the survey (Fig. 2).

The species comprising the list were collected as adults and larvae during the period 1968—71. A number of adults were reared from the fourth larval instar. Identification of the imagos was attempted using the keys of Coe,

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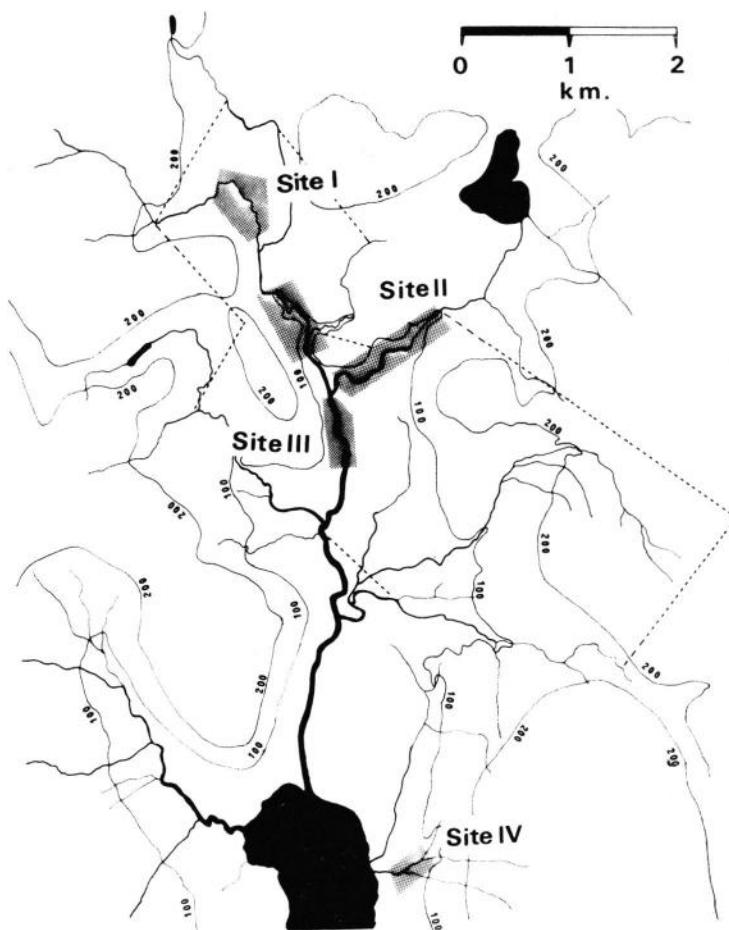


Fig. 1. The stream system showing the principal collection sites of larvae and adult chironomids. A Mundie trap was situated at site II. The broken line encloses the limit of coniferous afforestation. The map is based on the ordnance survey by permission of the government, licence number 121/72.

Freeman and Mattingly (1950); Brundin (1956); Fittkau (1962); Goetghebuer (1927—32) and Goetghebuer and Lenz (1936—50). Larvae only of seven taxa were taken during the survey and these were identified as far as possible using the keys of Bryce (1960); Chernovskii (1961); Lenz (1941); Mason (1968); Thienemann (1944) and Zavrel (1939).

In the following list the new Irish records of species or genera are marked with an asterisk; when only the larva was taken, this is stated. Some general notes on the ecology or distribution of the chironomids within the system are also appended. With some noted exceptions most species were taken in greatest abundance at sites II and IV and again in smaller, but comparable

Table 1. A tabulation of some characteristics of four experimental sites on the Altahoney system.

Characteristic	Site I	Site II	Site III	Site IV
Altitude (m.a.s.l.)	110—160	70—95	70—110	40—100
Nature of substratum .	boulders	boulders-sand	boulders	boulders
Width (m)	1.5—3.0	6.0—11.0	11.0—15.0	2.0—3.0
Surroundings	young forest grassland	older forest grassland	older forest grassland	deciduous trees
Depth (normal flow) midstream (cm)	7—15	7—20	5—15	8—20
Temperature	close to mean air temp.	close to mean air temp.	plus 2°C.	more variable
Observed fluctuation of midstream depth (cm)	plus 135	plus 130	plus 70	plus 200

numbers, at sites I and III. The occurrence of the Chironomidae within the system is described as very common, common, frequent or rare.

A list of the Chironomids occurring in the Altahoney system:

Sub-Family *Tanypodinae*

Genus *Krenopelopia* Fittkau

K. nigropunctata (Staeg.) rare

Genus *Macropelopia* Thienemann

M. notata (Meig.) common

Genus *Nilotanyxus* Fittkau

**N. dubius* (Meig.) common

Genus *Paramerina* Fittkau

P. cingulata (Walk.) rare

Genus *Rheopelopia* Fittkau

**R. eximia* (Edw.) very common

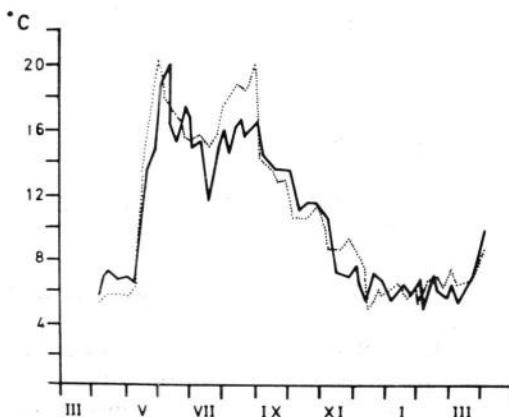


Fig. 2. Mean weekly max—min temperatures at site I (dotted line) and site II (thick line) during a 12 month period. The water temperature at site II showed closer agreement with the mean air temperature.

Genus *Thienemannimyia* Fittkau

* <i>T. lentigenosa</i> (Fries.)	rare
<i>T. northumbrica</i> (Edw.)	rare
Genus <i>Trissopelopia</i> Kieffer	
<i>T. longimana</i> (Staeg.)	rare

Sub-Family *Orthocladiinae*Genus *Brillia* Kieffer

<i>B. modesta</i> Meig.	very common
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Genus *Cardiocladius* Kieffer

<i>C. sp.</i>	larva, common
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Genus *Chaetocladius*

* <i>C. excerptus</i> Walk.	common
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Genus *Corynoneura* Winn

* <i>C. carriana</i> Edw.	very common
<i>C. lobata</i> Edw.	common

Genus *Cricotopus* (van der Wulp)

<i>C. bicinctus</i> (Meig.)	rare
* <i>C. inserpens</i> (Walk.)	very common
* <i>C. laricomalis</i> (Edw.)	rare
<i>C. motitator</i> (L.)	rare
<i>C. oscillator</i> (Meig.)	rare
<i>C. pulchripes</i> (Verr.)	rare
* <i>C. skirwithensis</i> (Edw.)	common
* <i>C. similis</i> Goethg.	rare
<i>C. tibialis</i> (Meig.)	rare
* <i>C. tremulus</i> (L.)	rare
<i>C. triannulatus</i> (Macq.)	rare

Genus *Dyscamptocladius*

<i>D. sp.</i>	larva, rare
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Genus *Eudactylocladius* Thienemann

<i>E. femineus</i> (Edw.)	common
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Genus *Eukiefferiella* Thienemann

<i>E. calvescens</i> Edw.	common
<i>E. hospita</i> Edw.	common
* <i>E. minor</i> (Verr.)	common
* <i>E. verralli</i> (Edw.)	common

Genus *Heterotanytarsus* Spärck

<i>H. apicalis</i> (Kieff.)	larva, common
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*Genus *Lapposmittia*

<i>L. sp.</i>	larva, common
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Genus *Limnophyes* (Eaton) Brundin

<i>L. prolongatus</i> (Kieff.)	larva, common
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Genus *Orthocladius* van der Wulp

* <i>O. rhyacobius</i> (Kieff.)	rare
<i>O. saxicola</i> (Kieff.)	rare

Sub-genus *Euorthocladius* Thienemann

<i>E. frigidus</i> Zett.	common
<i>E. rivicola</i> (Kieff.)	frequent

Genus *Parametriocnemus* Thienemann

<i>P. stylatus</i> (Kieff.)	rare
Genus <i>Psectrocladius</i> Kieffer	
<i>P. sordidellus</i> (Zett.)	rare
Genus <i>Rheocricotopus</i> Thienemann & Harnisch	
<i>R. chalybeatus</i> (Edw.)	common
Genus <i>Synorthocladius</i> Thienemann	
<i>S. semivirens</i> (Kieff.)	common
Genus <i>Thienemaniella</i> Kieffer	
<i>T. clavicornis</i> Kieff.	common
* <i>T. majuscula</i> Edw.	common

Sub-Family *Diamesinae*Genus *Diamesa* Meigen

* <i>D. cinerella</i> (Meig.)	very common
<i>D. insignipes</i> Kieff.	very common
Genus <i>Pothastia</i> Kieffer	
<i>P. gaedii</i> (Meig.)	very common
* <i>P. montium</i> (Edw.)	very common

Sub-Family *Chironominae*Tribe *Chironomini*Genus *Microtendipes* Kieffer

<i>M. tarsalis</i> Walk.	larva, common
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Genus *Pentapedilum* Kieffer

<i>P. tritum</i> (Walk.)	rare
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Genus *Polypedilum* Kieffer

<i>P. acutum</i> Kieff.	common
<i>P. convictum</i> (Walk.)	common

Genus *Kribioxenus* Kieffer

* <i>K. brayei</i> Goetgh.	rare
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Tribe *Tanytarsini*Genus *Microspectra* Kieffer

<i>M. bidentata</i> Goetgh.	rare
<i>M. sp. praecox</i> group	larva, common

Genus *Parapsectra* Reiss.

* <i>P. nana</i> Meig.	common
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Genus *Paratanytarsus* Kieffer

* <i>P. intricatus</i> Goetgh.	rare
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Genus *Tanytarsus* van der Wulp

<i>T. arduennsis</i> Goetgh.	common
<i>T. eminulus</i> Walk.	common

In addition to the above list, the following imagos were tentatively, but, due to their poor condition, not conclusively, identified: *Telmatopelopia nemorum* Goetgh. from a female specimen and *Corynoneura flavescens* Edw. from a male.

The distribution of some chironomid species

A detailed survey of Chironomids was not undertaken but, in connection with another investigation of lotic invertebrates a number of Chironomids were listed. An account of the sampling procedure has been given elsewhere (Fahy, 1972); the sites from which chironomid species were identified were at the following national grid reference points: L 9665, M 0968, N 2902, R 9618, S 1306 and T 2309. The following species were taken in all samples: *Eukiefferiella calvescens* and/or *verralli*, *E. hospita*, *E. minor*, *Corynoneura carriana*, *C. lobata*, *Thienemanniella clavicornis*, *Pothastia montium*, *P. gaedii*, *Synorthocladius semivirens* and *Cricotopus inserpens*.

The composition of the Chironomid community

There are few published accounts of lotic chironomid communities in Ireland. Humphries and Frost (1937) examined the fauna of submerged mosses in the River Liffey, but only the larval fauna was handled and few taxa were identified to species; 28 genera were recorded. Using these results, those obtained by Murray (1970), (a) from 18 Irish Rivers, and (b) from the River Dodder and the results obtained by Thienemann (1936) in Alpine Rivers, a comparison is made in Table 2.

Table 2. The composition of lotic Chironomid communities as given by several authors.

	Tany-podinae	Orthocladii-nae	Diamesi-nae	Chironomini	Tanytarsini
Humphries & Frost (1937)	+	+++	+	+	++
Murray (R. Dodder)	++	+++	+	++	++
Murray (18 Rivers)	++	+++	+	++	++
Fahy & Murray	++	+++	+	+	+
Thienemann (1936)	+	+++	+	+	+

Where + = Very few, ++ = more, +++ = many genera, based on the system used by Thienemann (1936).

Table 3. The occurrence in lotic waters of species belonging to four Chironomid taxa, expressed as a percentage; based on the results of Murray (1970), Thienemann (1954) and this survey. Thienemann's figures are recalculated to exclude the Ceratopogonidae and Podonominae. The figures in brackets under the Altahoney column represent the percentage individuals taken during a 12 month sampling programme. The total number on which this is calculated is 20,702.

	Thienemann 1954		Altahoney	Dodder
	Mountain stream	Lowland stream		
Tanypodinae	9	15	14 (8)	12
Orthocladiinae (including Diamesinae)	73	39	66 (80)	67
Chironomini	7	18	10 (2)	15
Tanytarsini	11	28	10 (10)	6
Total numbers involved	151 species	74 species	54 species (20,702 individuals)	67 species

Table 4. The Ecology of nine Chironomid species as indicated by Fittkau, Schlee and Reiss (1967). Legend: 2, wells; 5, lakes; 6, temporary pools; 8, Brackish waters; 9, saline waters; 8, 10 moors.

Species	Habitat(s)
<i>Paramerina cingulata</i>	2, 5, 6
<i>Corynoneura lobata</i>	2, 5
<i>Cricotopus laricomalis</i>	5
<i>C. tibialis</i>	5, 6
<i>Heterotanytarsus apicalis</i>	5, 10
<i>Psectrocladius sordidellus</i>	5, 6, 8
<i>Polypedilum acutum</i>	5
<i>Parapsectra nana</i>	5, 9
<i>Tanytarsus eminulus</i>	5

The chironomid fauna of the Altahoney River shows good agreement in its generic constitution with the other results. As is to be expected the Orthocladiinae are the dominant sub-family. Members of this taxon are generally regarded as the most typical chironomids in the lotic habitat.

In Table 2 the greater representation of the Chironomini in Murray's results may be due to a substantial number of his samples having been collected in a lowland (or sluggish) stream (see also Table 3).

Thienemann (1954) summarises the number of species recorded from mountain streams in Lapland and lowland streams in Schleswig-Holstein. These results are compared with those obtained in the present survey and the results of Murray (1970) in Table 3.

Noteworthy points in the present results are that the Orthocladiinae comprise 66 % of the species total but 80 % of the individuals while the Chironomini constitute 10 % of the species but a mere 2 % of the total fauna.

Some species taken during the present survey are not regarded as typical of the lotic environment (Fittkau *et al* 1967) — Table 4. In each case, the normal habitat is lentic rather than flowing water. *Cricotopus tibialis*, previously recorded from lakes and temporary pools has been taken in the River Boyne (Murray, 1970). The record for *Heterotanytarsus apicalis* is not surprising because it is known to occur in oligotrophic waters such as lakes and bogs. *Polypedilum acutum* has also been taken in Ireland by Murray (1970). The ecological range for *Parapsectra nana* (*Microspectra monticola* in Fittkau *et al*, 1967), has recently been re-defined (Reiss, 1969). It is now recognized as a cold stenothermous species occurring in mountainous areas of Central Europe, Scandinavia and England and is normally found near river sources. *Tanytarsus eminulus*, more usually found in lakes, has recently been recorded from the Thorsan River in Holstein (Reiss and Fittkau, 1971) and has been taken in Ireland in the River Boyne by Murray (1970).

Summary

The Chironomid fauna of a small stream system in Western Ireland is described on the results of a three year programme during which twenty thousand individuals were identified. The stream system was oligotrophic and air and water temperatures

were in close agreement during the period. 54 species, of which 19 are new country records, were taken and the composition of the family is compared with results obtained in Europe and elsewhere in Ireland.

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